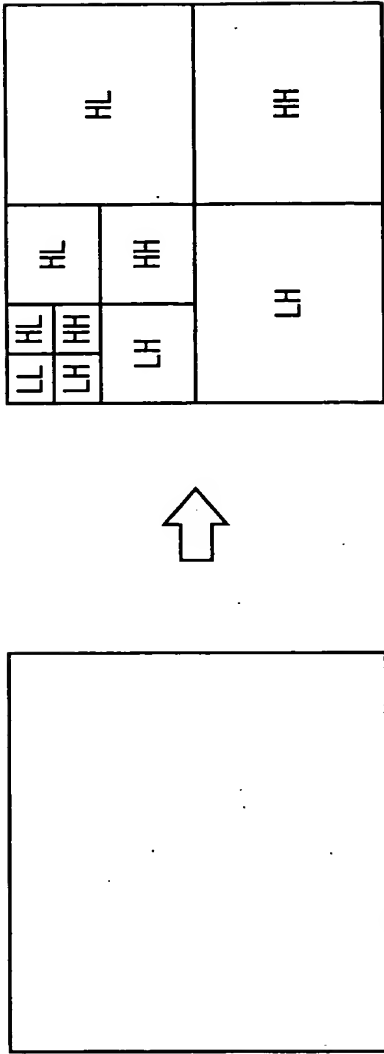FIG. 1(RELATED ART)

FIG. 2A
(RELATED ART)
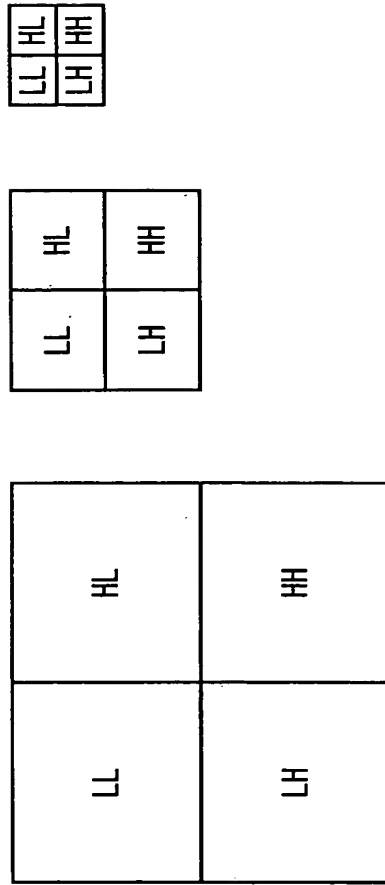

FIG. 2B
(RELATED ART)
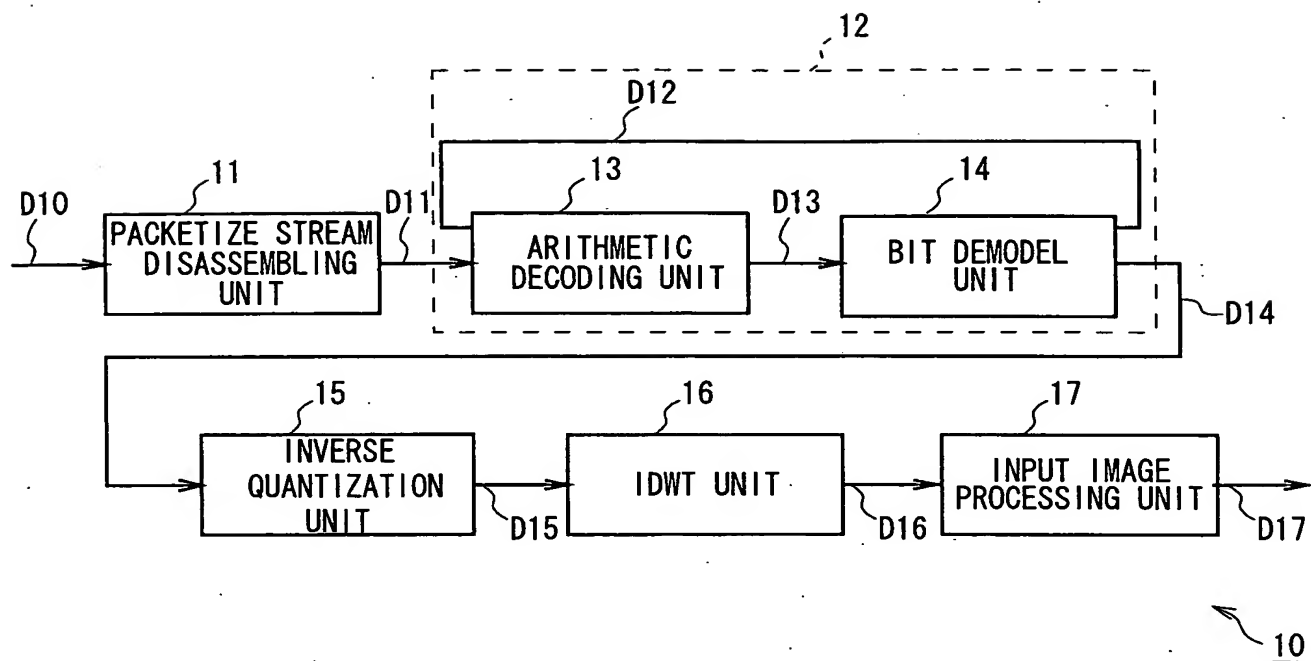
FIG. 3(RELATED ART)
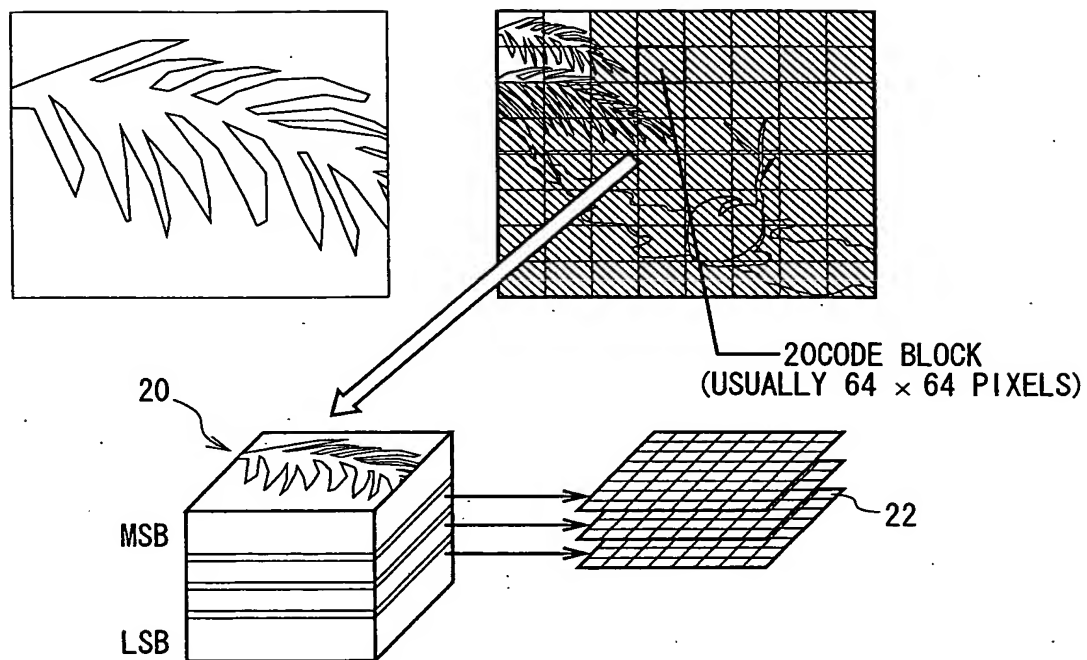
—20CODE BLOCK
(USUALLY 64 × 64 PIXELS)

MSB

LSB

22

FIG. 4

X_c

Y_c

CODE BLOCK

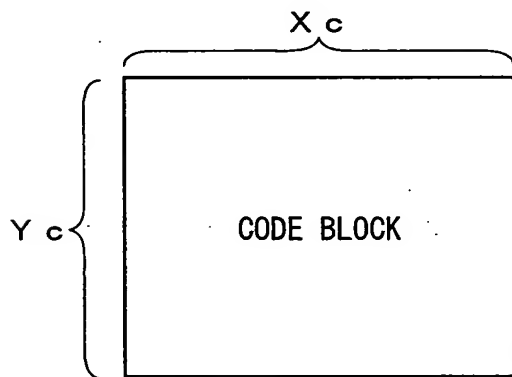X_c AND Y_c ARE POWERS OF 2
• $4 \leqq X_c \leqq 1024$、 $4 \leqq Y_c \leqq 1024$
• $X_c \times Y_c \leqq 4096$

FIG. 5

CODE BLOCK

▨ NORMAL SIZE ▨ EXCEPTIONAL SIZE

FIG. 6

PLUS AND MINUS SIGNS BIT PLANE

Magnitude MSB

BIT PLANES IN WHICH
ALL VALUES ARE 0
(ZERO BIT PLANES)

FIRST BIT PLANE IN WHICH
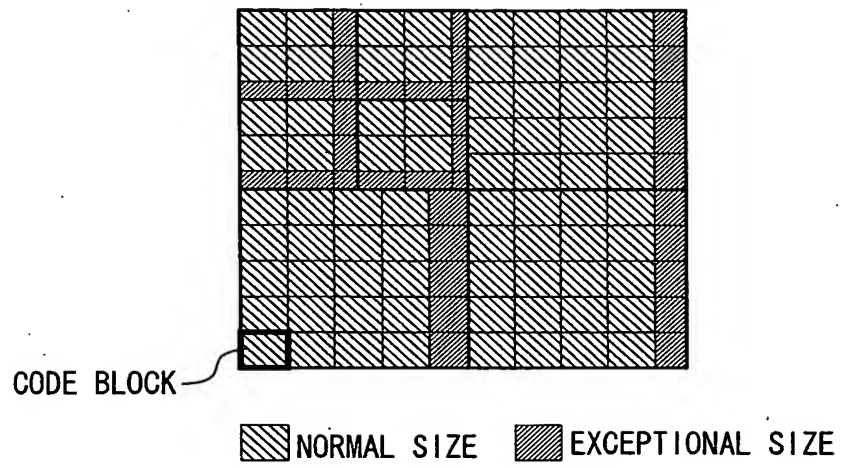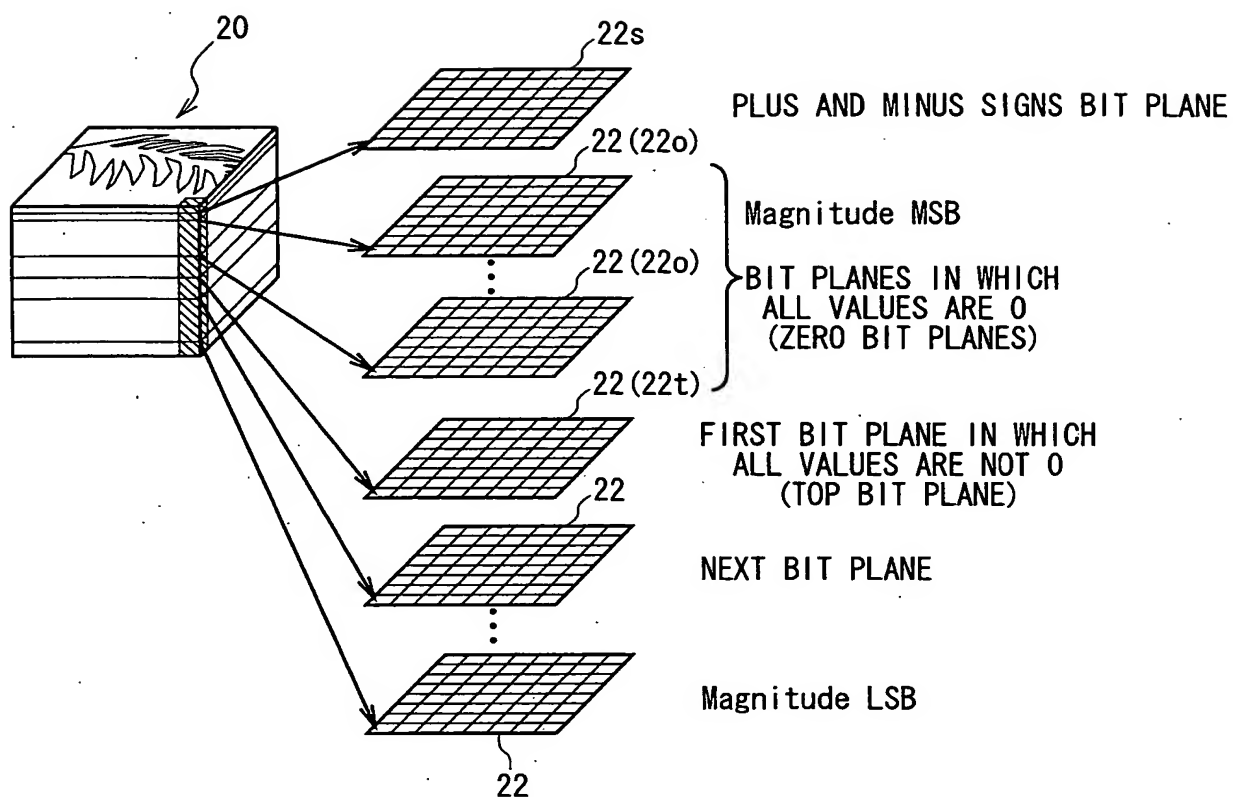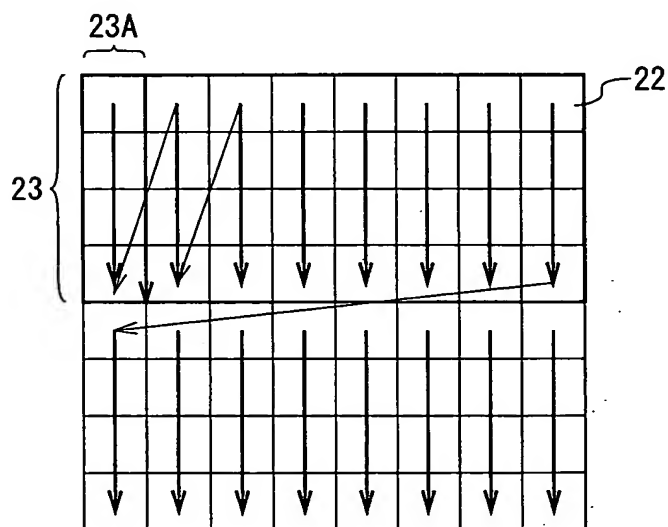ALL VALUES ARE NOT 0
(TOP BIT PLANE)

NEXT BIT PLANE

Magnitude LSB

FIG. 7

FIG. 8

FIG. 9

FIG. 10

Significance Propagation

Magnitude Refinement Pass

Clean up Pass

FIG. 11

Significance Propagation

Magnitude Refinement Pass

Clean up Pass

FIG. 12

22 PROCESSING BIT PLANE

30 PLUS AND MINUS SIGNS PLANE
31 SIG PLANE
32 REF PLANE
33 DONE PLANE

FIG. 13

PROCESSING BIT PLANE DATA Significance

22

31

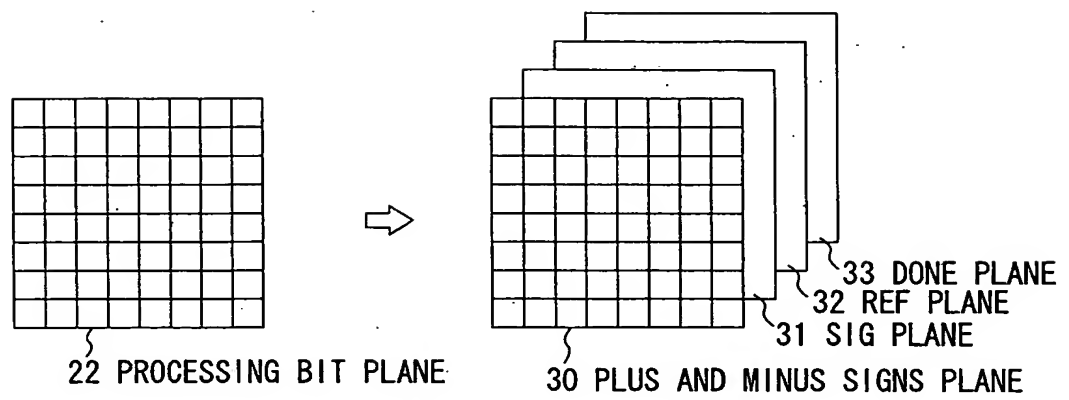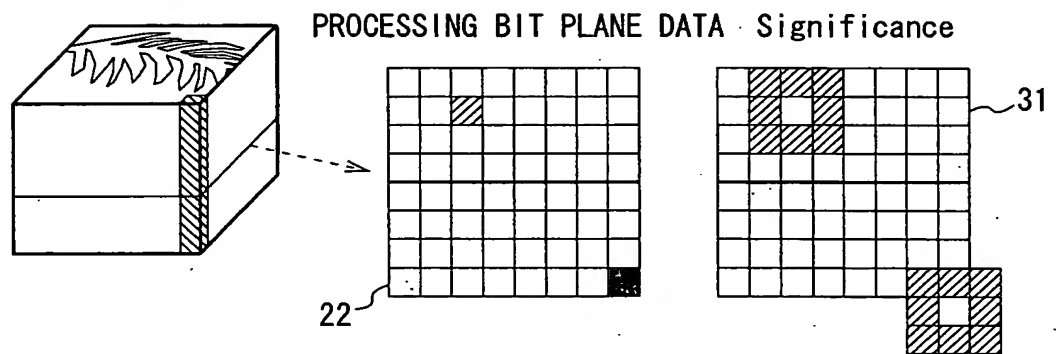FIG. 14A   FIG. 14B   FIG. 14C

PROCESSING BIT PLANE   SIG PLANE   PLUS AND MINUS SIGNS PLANE

22

31

30
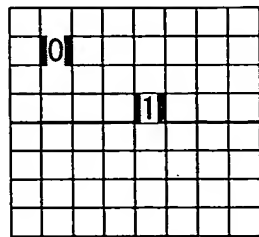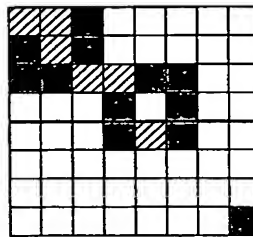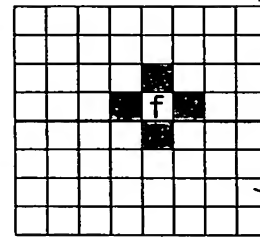
▨ Significance

FIG. 15A   FIG. 15B   FIG. 15C

CONDITIONS	Context	Symbol
DATA, WHICH IS INSIGNIFICANT ITSELF AND IN THE VICINITY OF WHICH SIGNIFICANT EXISTS, IS 0	Cx	0
DATA, WHICH IS INSIGNIFICANT ITSELF AND IN THE VICINITY OF WHICH SIGNIFICANT EXISTS, IS 1	Cx	1
CHANGE TO SIGNIFICANT WITH DATA OF 1, AND SUBSEQUENTLY SIGN IS CHANGED TO BIT MODEL	Sign cx	f

FIG. 15D

LL OR LH COMPONENT			HL COMPONENT			HH COMPONENT		CX	BIT
ΣH	ΣV	ΣD	ΣH	ΣV	ΣD	ΣH+ΣV	ΣD		
2	–	–	–	2	–	–	>=3	8	
1	>=1	1	>=1	1	–	>=1	2	7	
1	0	>=1	0	1	>=1	0	2	6	
1	0	0	0	1	0	>=2	1	5	
0	2	–	2	0	–	1	1	4	X
0	1	–	1	0	–	0	1	3	
0	0	>=2	0	0	>=2	>=2	0	2	
0	0	1	0	0	1	1	0	1	
0	0	0	0	0	0	0	0	0	

FIG. 16

X=0: PLUS
X=1: MINUS

FIG. 17A

BIT=X xor XR

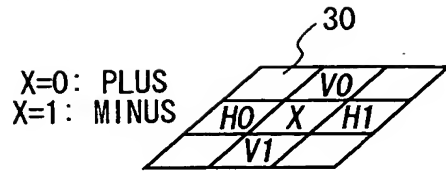| H値	V値	CX	XR
1	1	13	
1	0	12	
1	−1	11	0
0	1	10	
0	0	9	
0	−1	10	
−1	1	11	1
−1	0	12	
−1	−1	13	

FIG. 17C

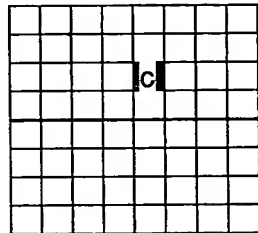|		VALUE
{V0, V1} {H0, H1}	{SIGNIFICANT OF PLUS, SIGNIFICANT OF PLUS} {SIGNIFICANT OF PLUS, INSIGNIFICANT}	1
	{SIGNIFICANT OF PLUS, SIGNIFICANT OF MINUS} {INSIGNIFICANT, INSIGNIFICANT}	0
	{SIGNIFICANT OF MINUS, SIGNIFICANT OF MINUS} {SIGNIFICANT OF MINUS, INSIGNIFICANT}	−1

FIG. 17B

PROCESSING BIT PLANE

SIG PLANE
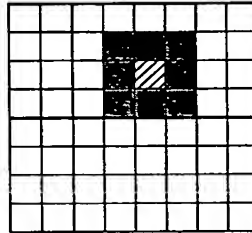
PLUS AND MINUS SIGNS PLANE
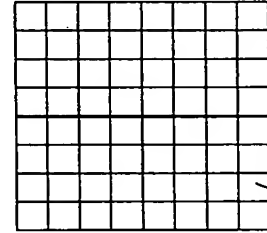
▨ Significance

FIG. 18A   FIG. 18B   FIG. 18C

CONDITION	Cx	bit
CHANGE OF SIGNIFICANT DATA TO BIT MODEL CHANGE TO MR PASS FOR THE FIRST TIME WHEN CHANGED TO SIGNIFICANT	Cx	c

FIG. 18D

FIG. 19A

ΣH+ΣV+ΣD	PERTINENT COEFFICIENT IS ENCODED WITH THIS PASS FIRST	Cx	BIT
Don't care	No	16	
>=1	Yes	15	X
==0	Yes	14	

FIG. 19B

D0	V0	D1
H0		H1
D2	V1	D3

ΣD IS THE NUMBER OF SIGNIFICANT ONES IN D0-3

PROCESSING BIT PLANE

SIG PLANE

PLUS AND MINUS SIGNS PLANE

(A)   23A   23   22

FIG. 20A

(B)   31   ▨ Significance

FIG. 20B

(C)   30   f
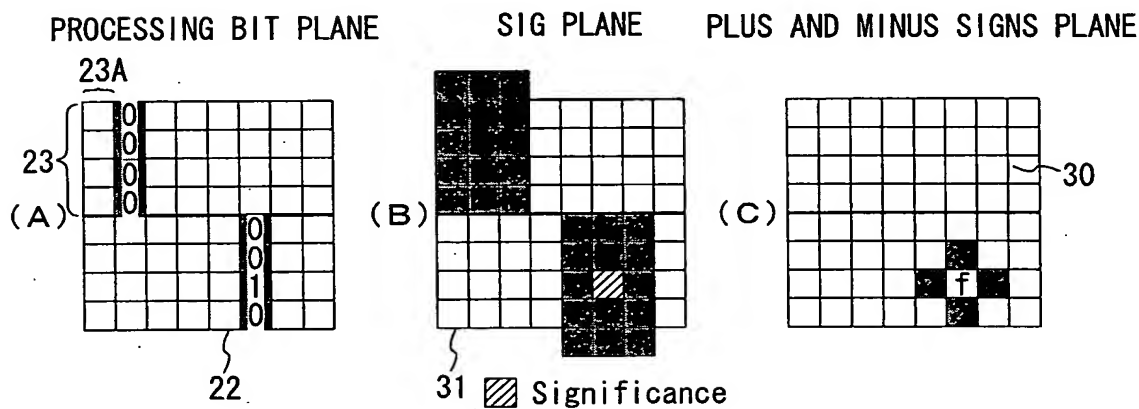
FIG. 20C

FIG. 20D

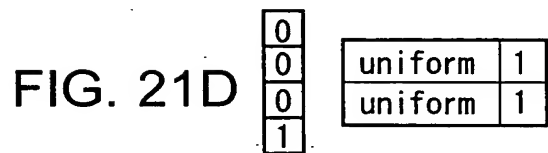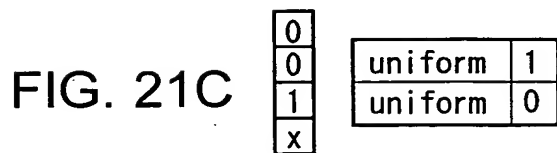| CONDITIONS		Cx	bit
ALL DATA OF STRIPE ARE 0, AND ALL CORRESPONDING VICINITIES ARE NOT SIGNIFICANT		run	c
AT LEAST ONE OF DATA OF STRIPE IS 1, THERE IS NO SIGNIFICANT IN THE VICINITY CHANGE TO SIGNIFICANT WITH DATA OF 1 SAME PROCESSING AS SP PASS IS PERFORMED AFTER THAT		run	c
		uniform	c
		uniform	c
		Sign CX	f
		CX	0

FIG. 20D

FIG. 21A
1
x
x
x

uniform	0
uniform	0

FIG. 21B
0
1
x
x

uniform	0
uniform	1

FIG. 21C
0
0
1
x

uniform	1
uniform	0

FIG. 21D
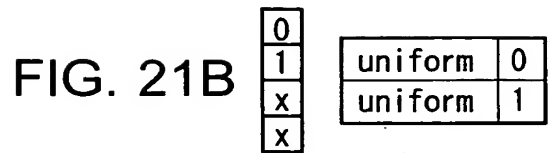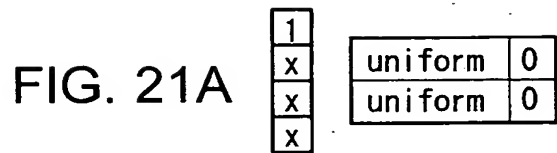| 0 |
|---|
| 0 |
| 0 |
| 1 |

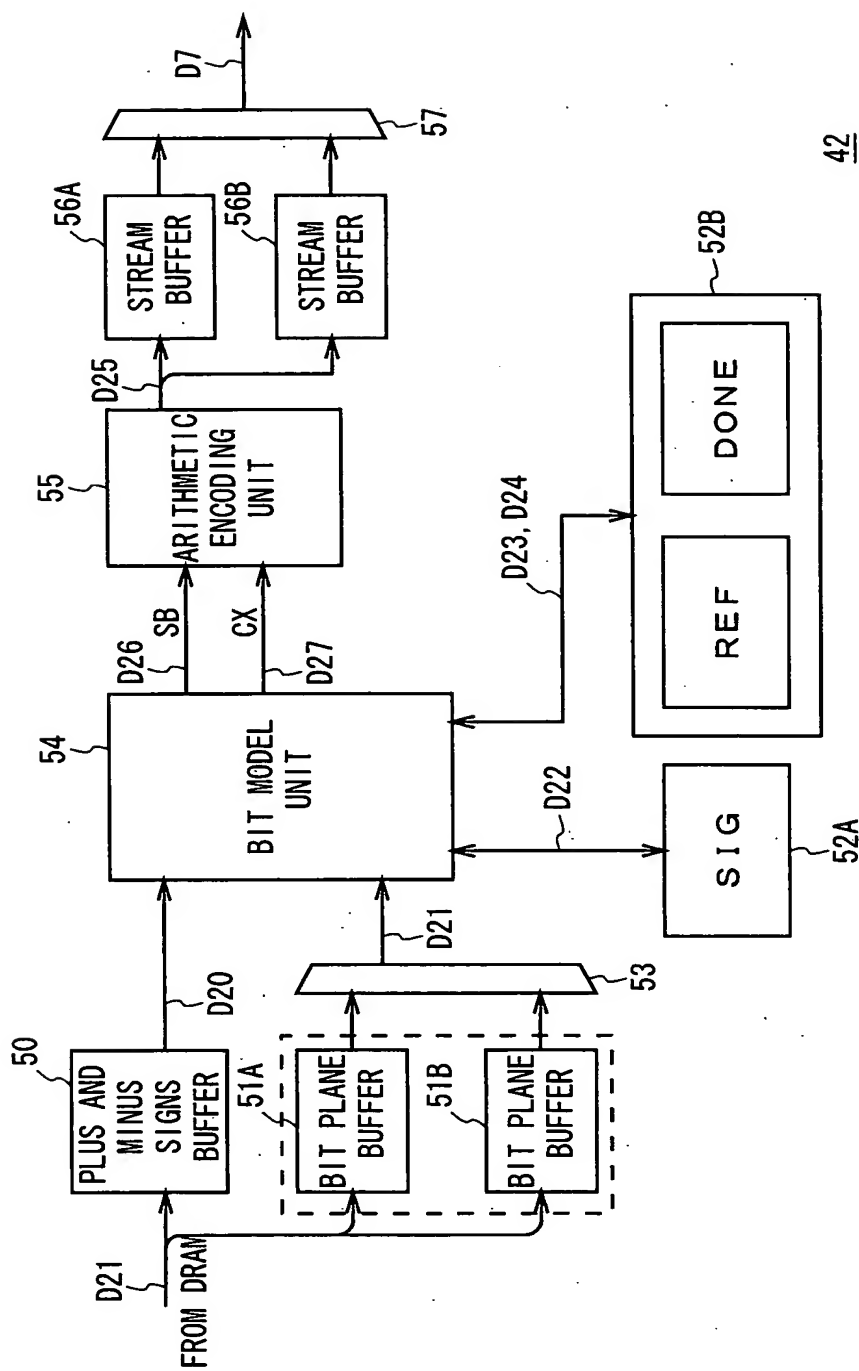| uniform	1
uniform	1
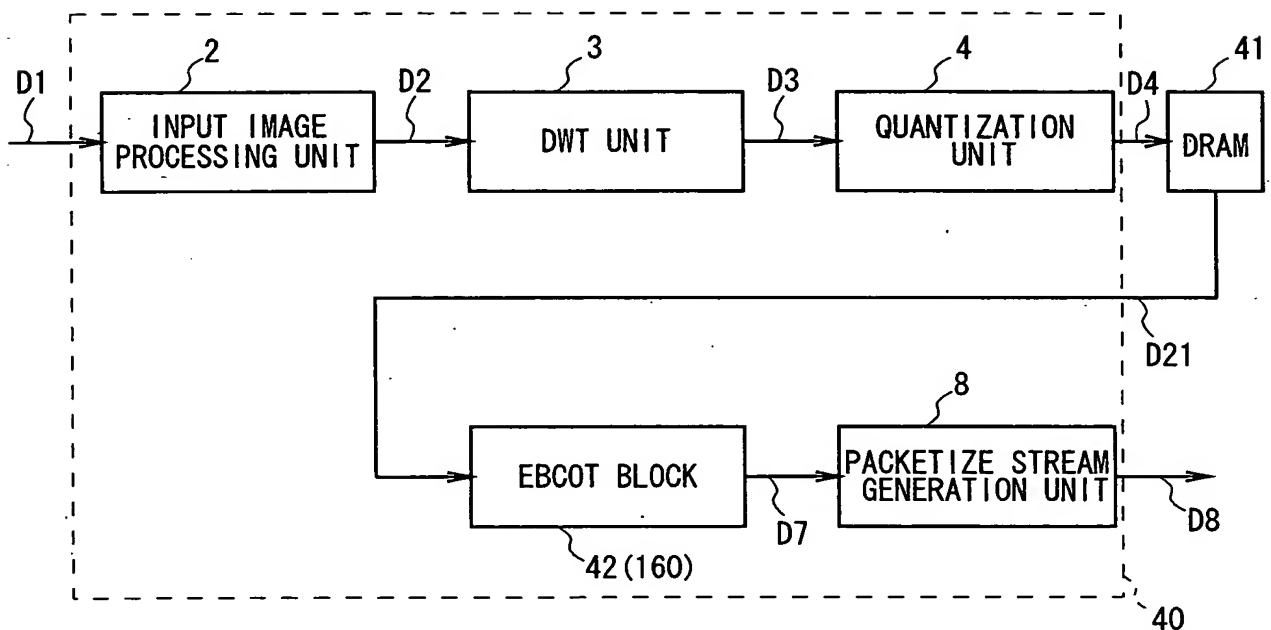
FIG. 22

FIG. 23
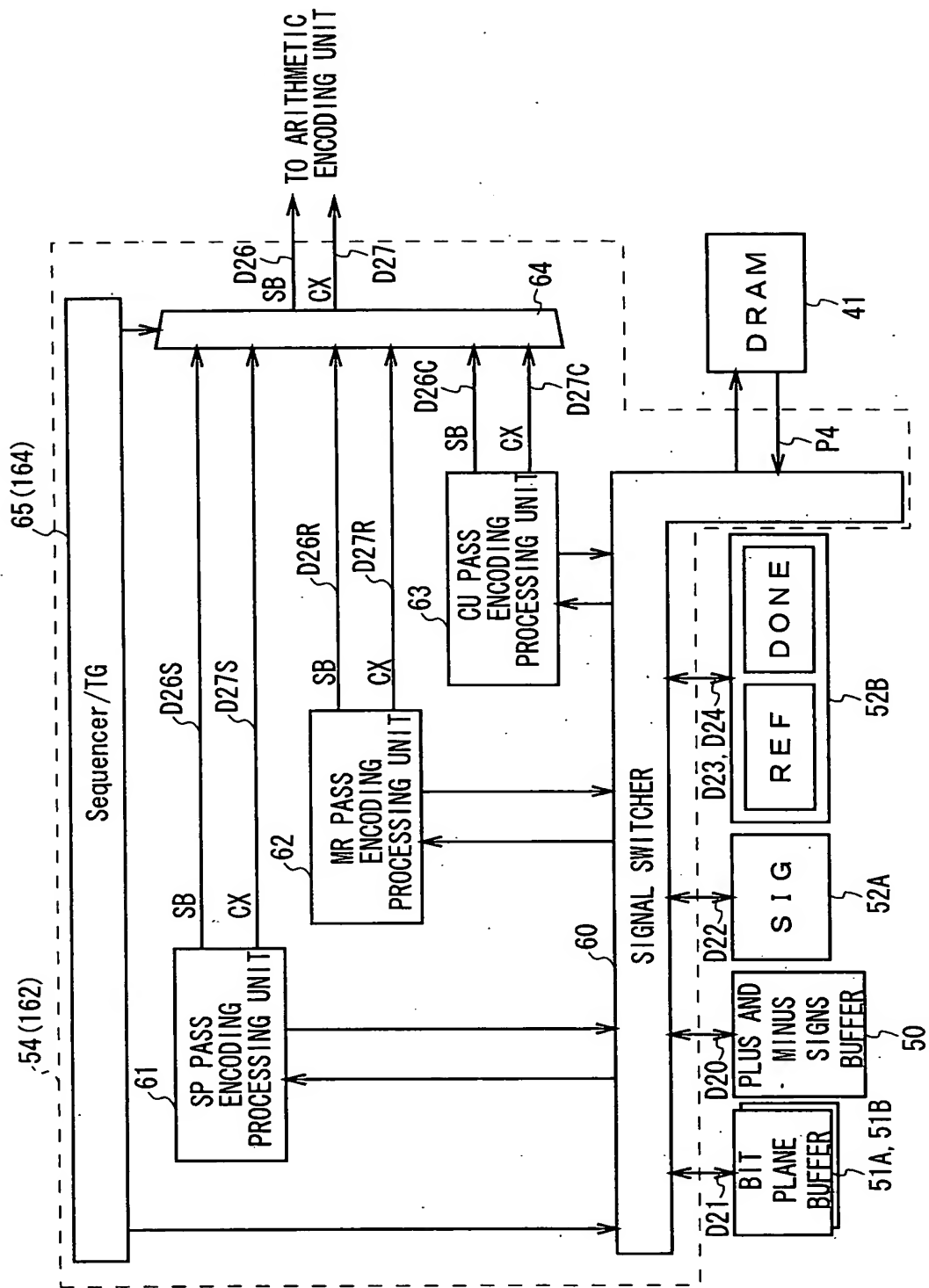
FIG. 24

PLUS AND MINUS SIGNS PLANE
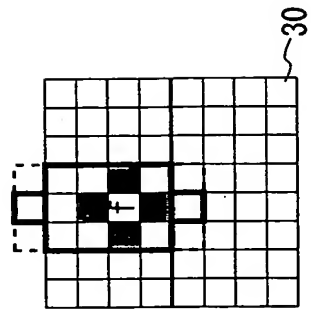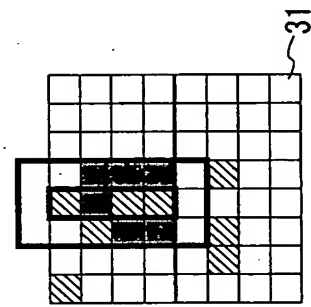
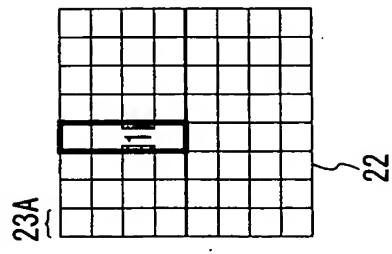30

FIG. 25C

SIG PLANE

31

FIG. 25B

REF PLANE
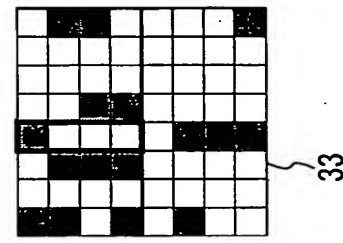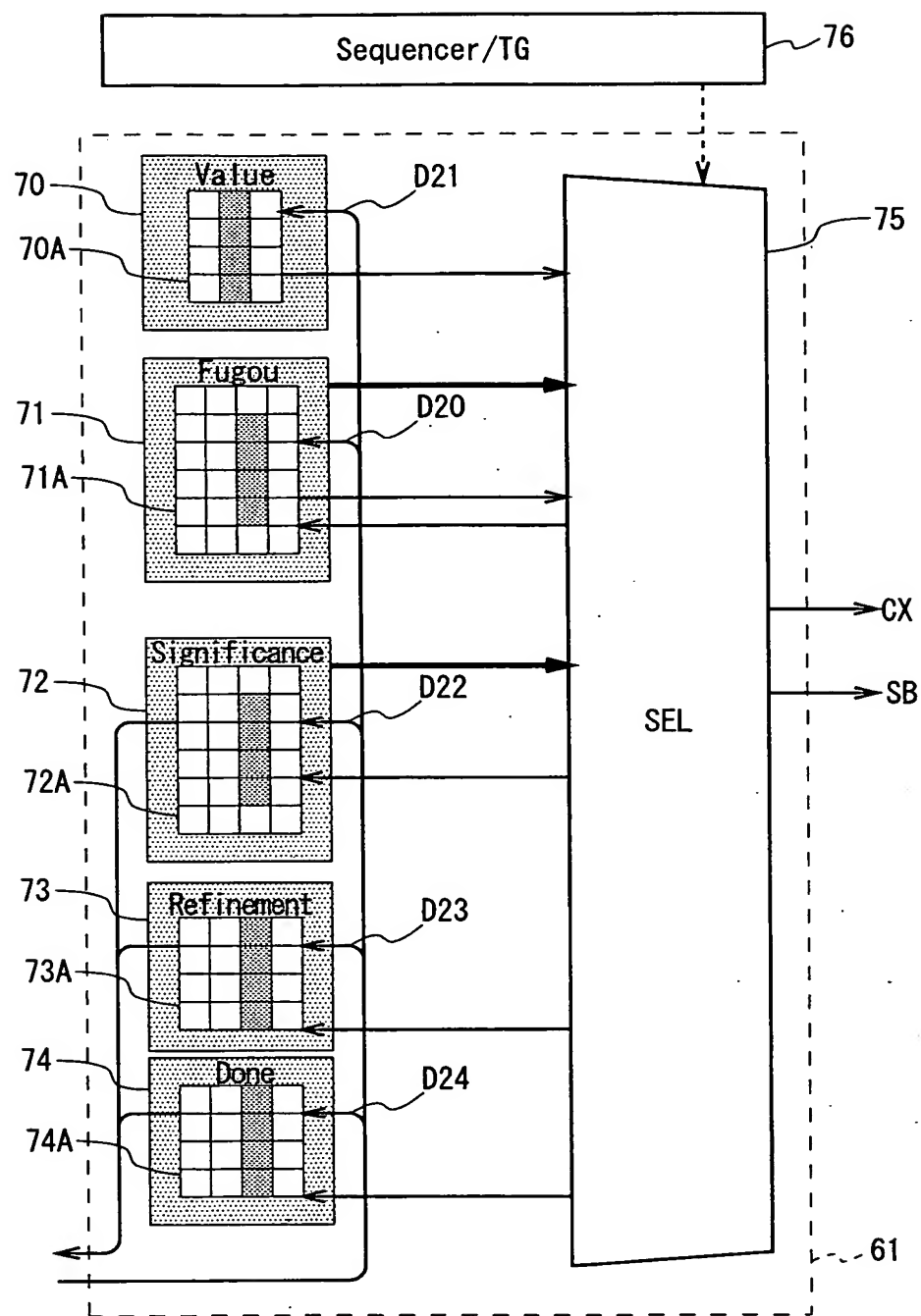
32

FIG. 25E

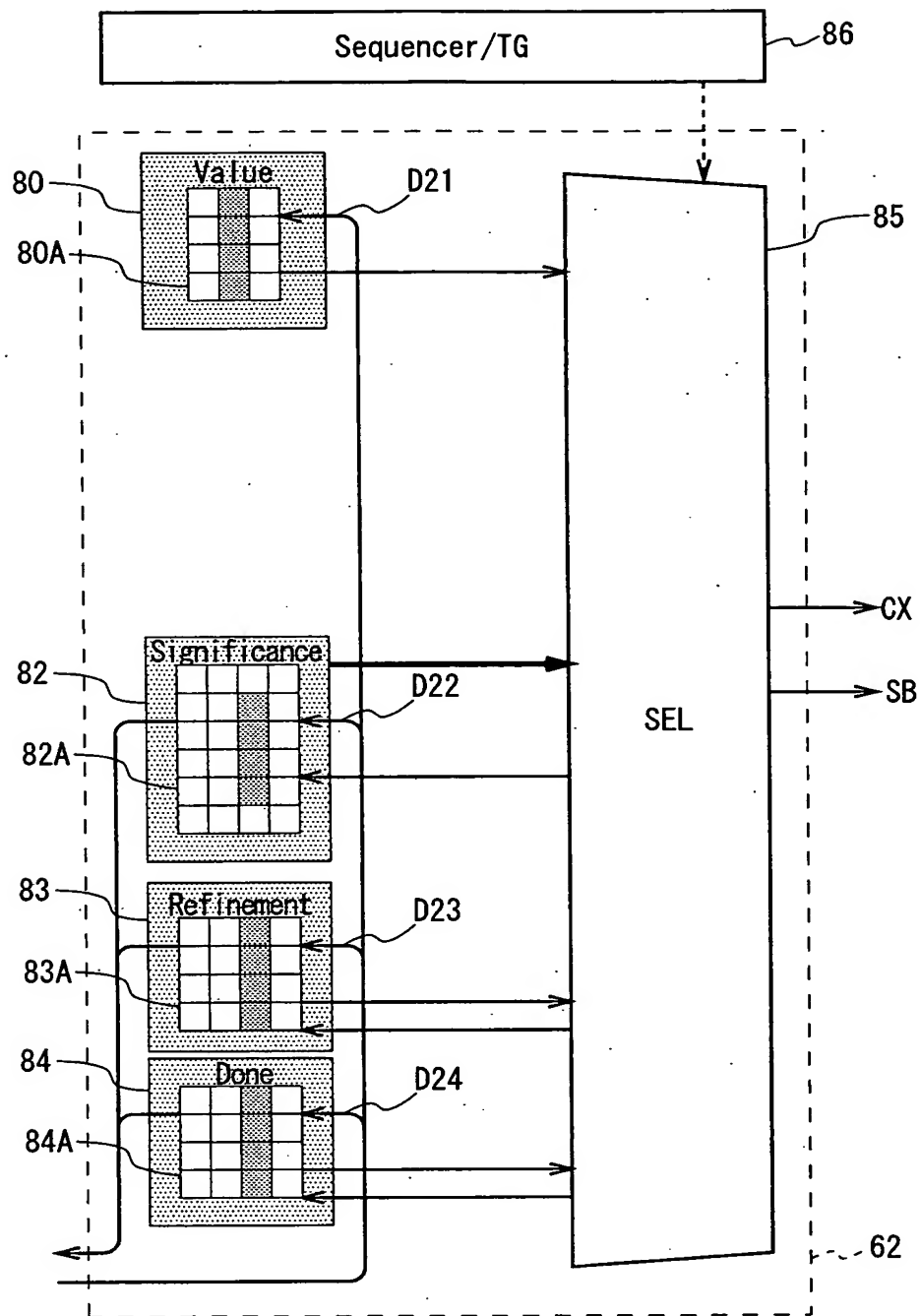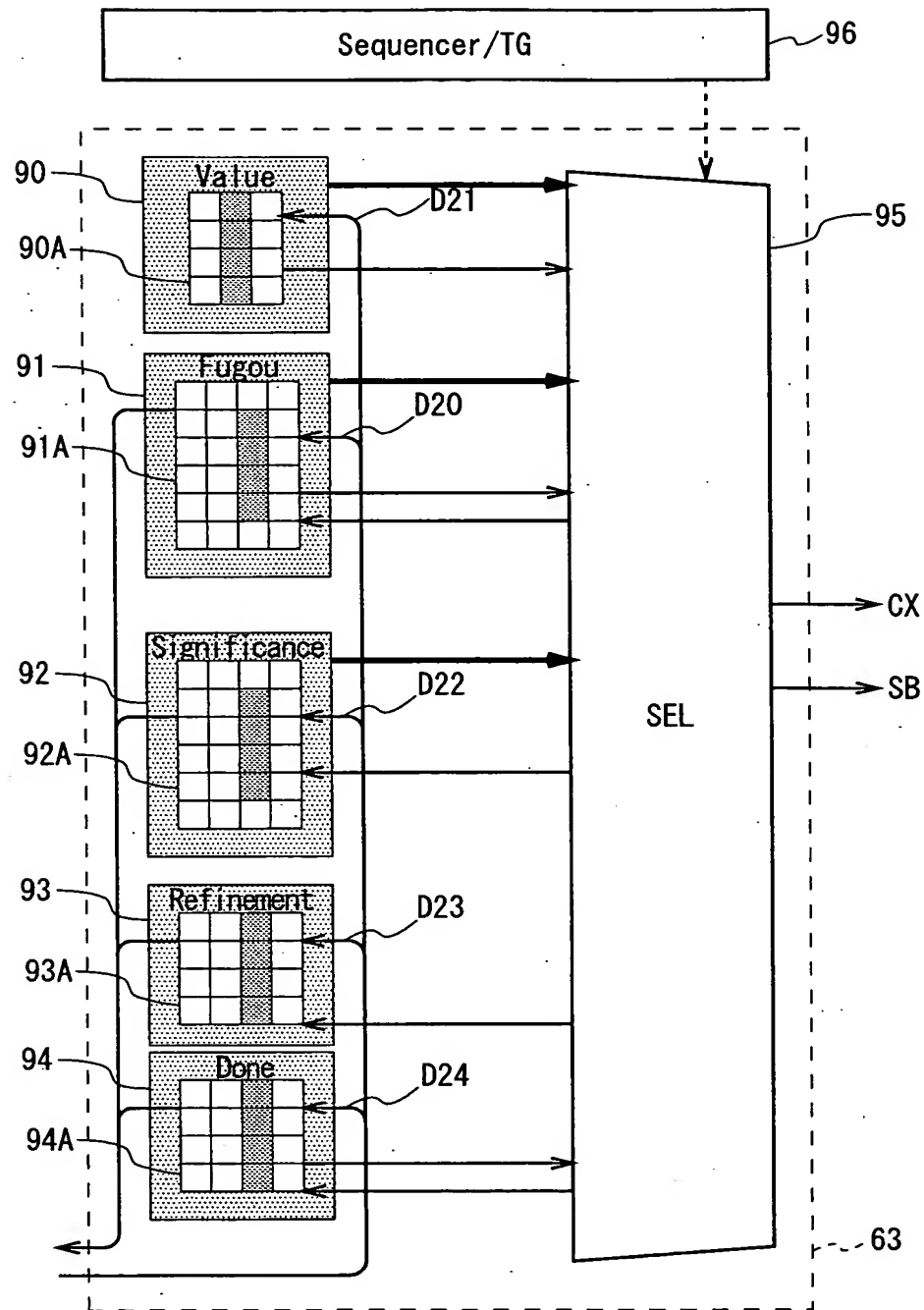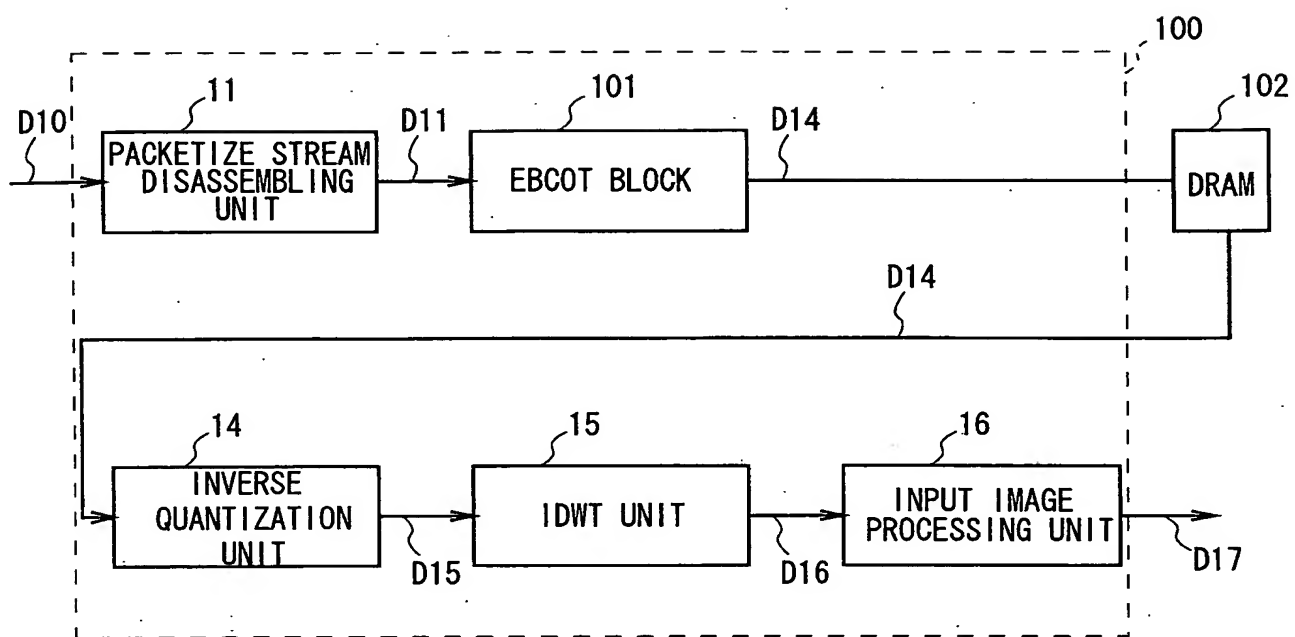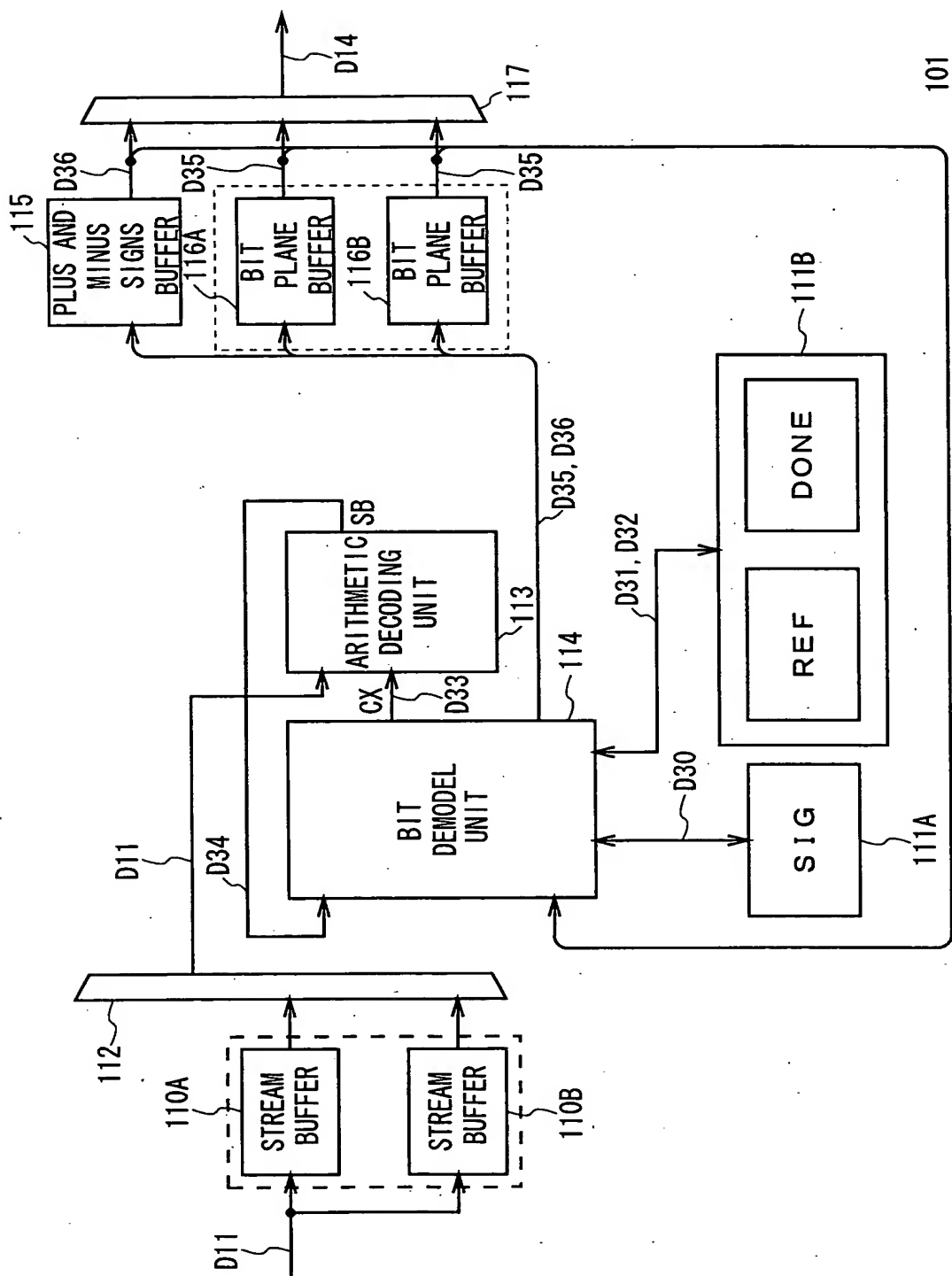PROCESSING BIT PLANE

23A

22

FIG. 25A

DONE PLANE

33
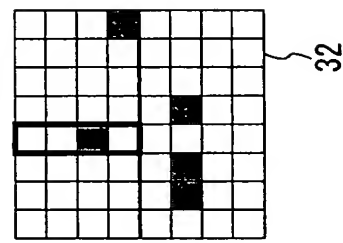
FIG. 25D

FIG. 26

FIG. 27

FIG. 28

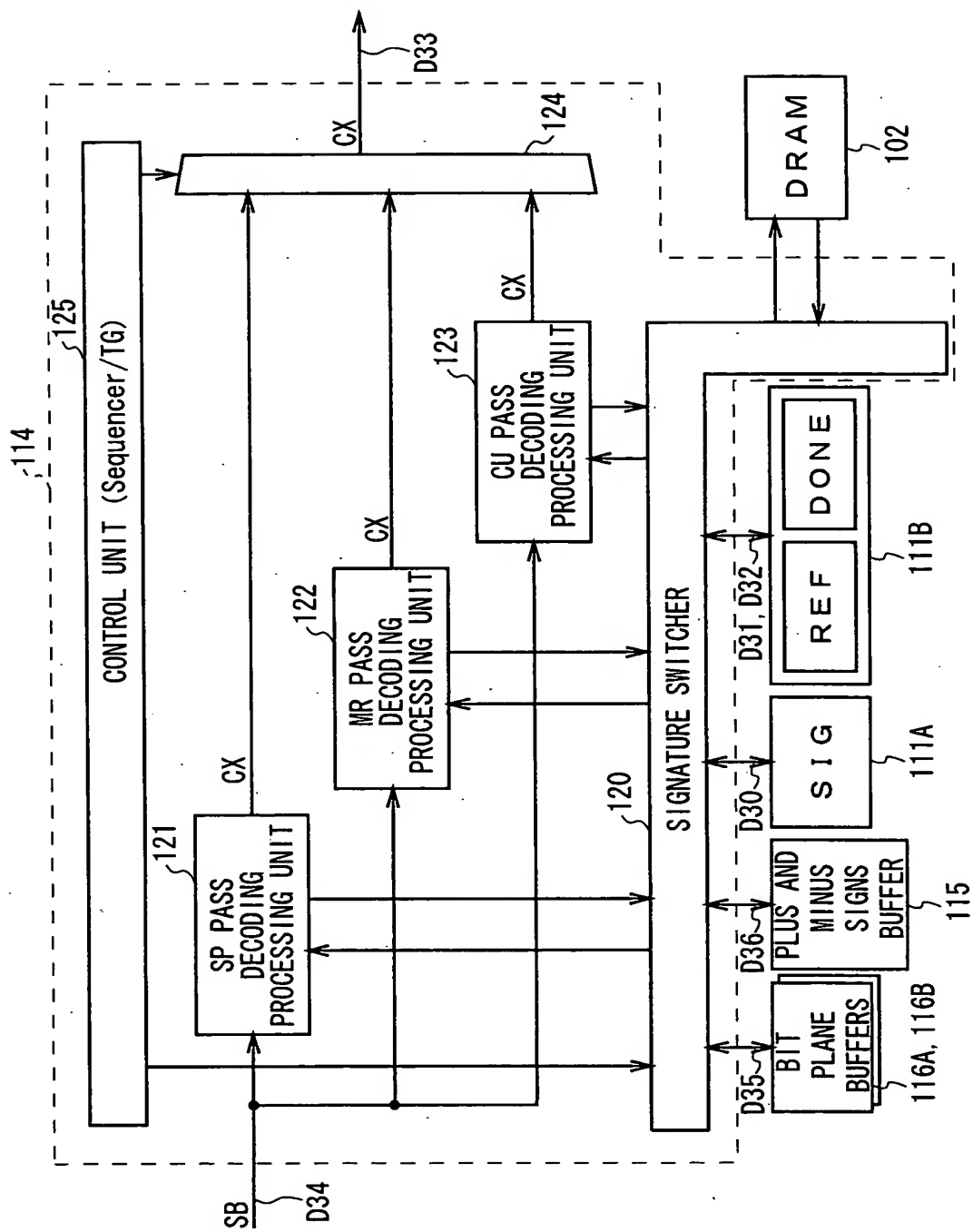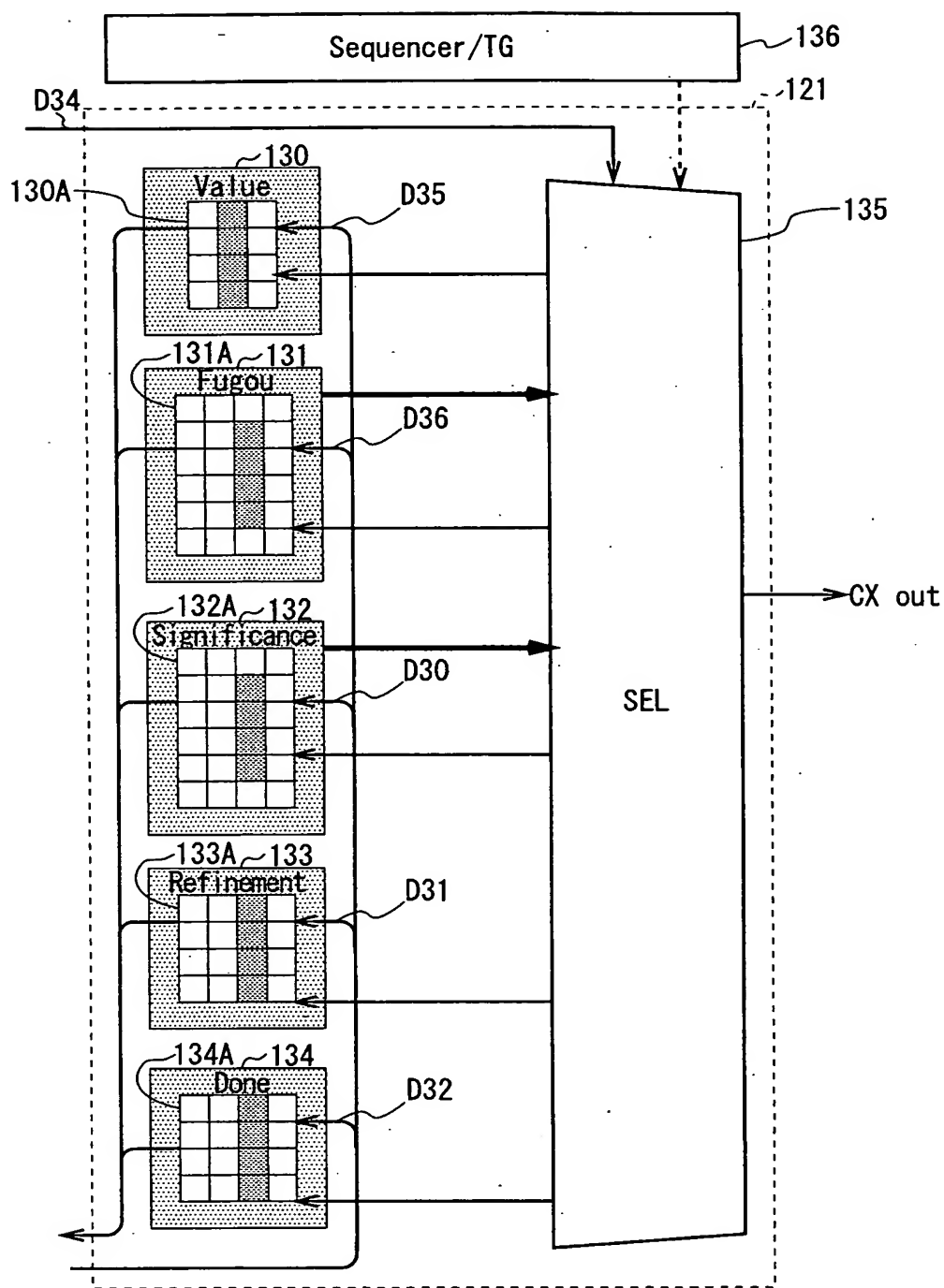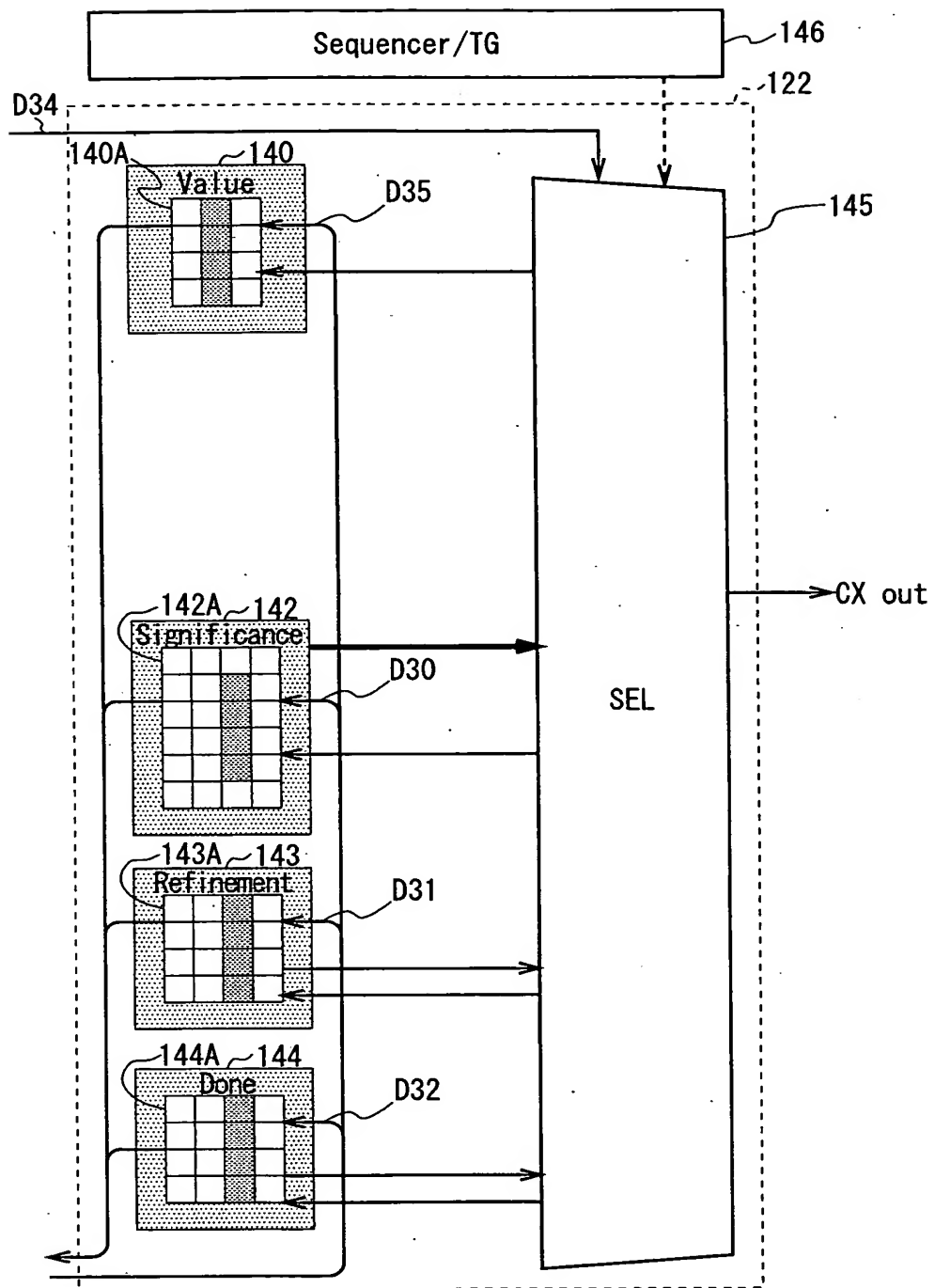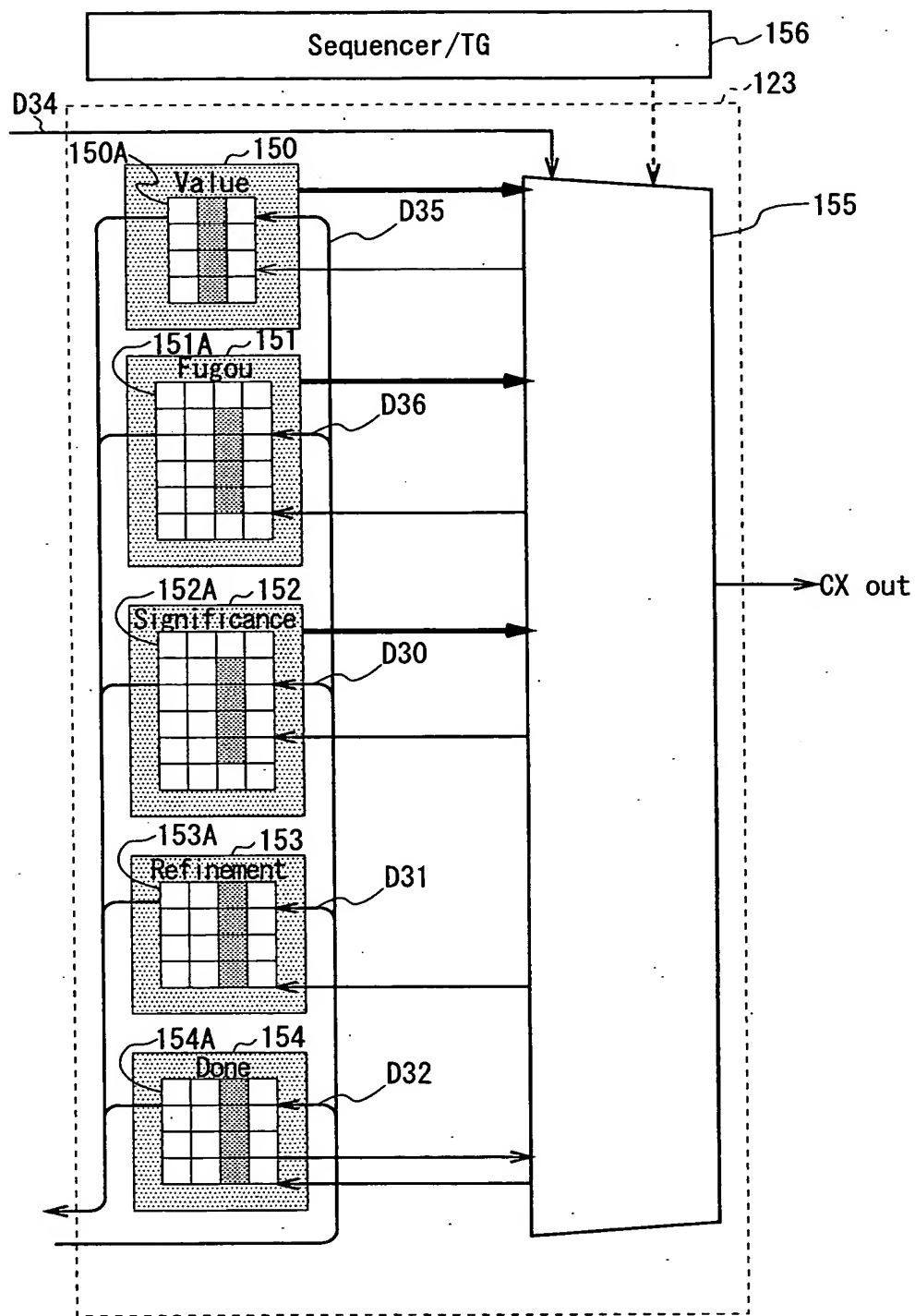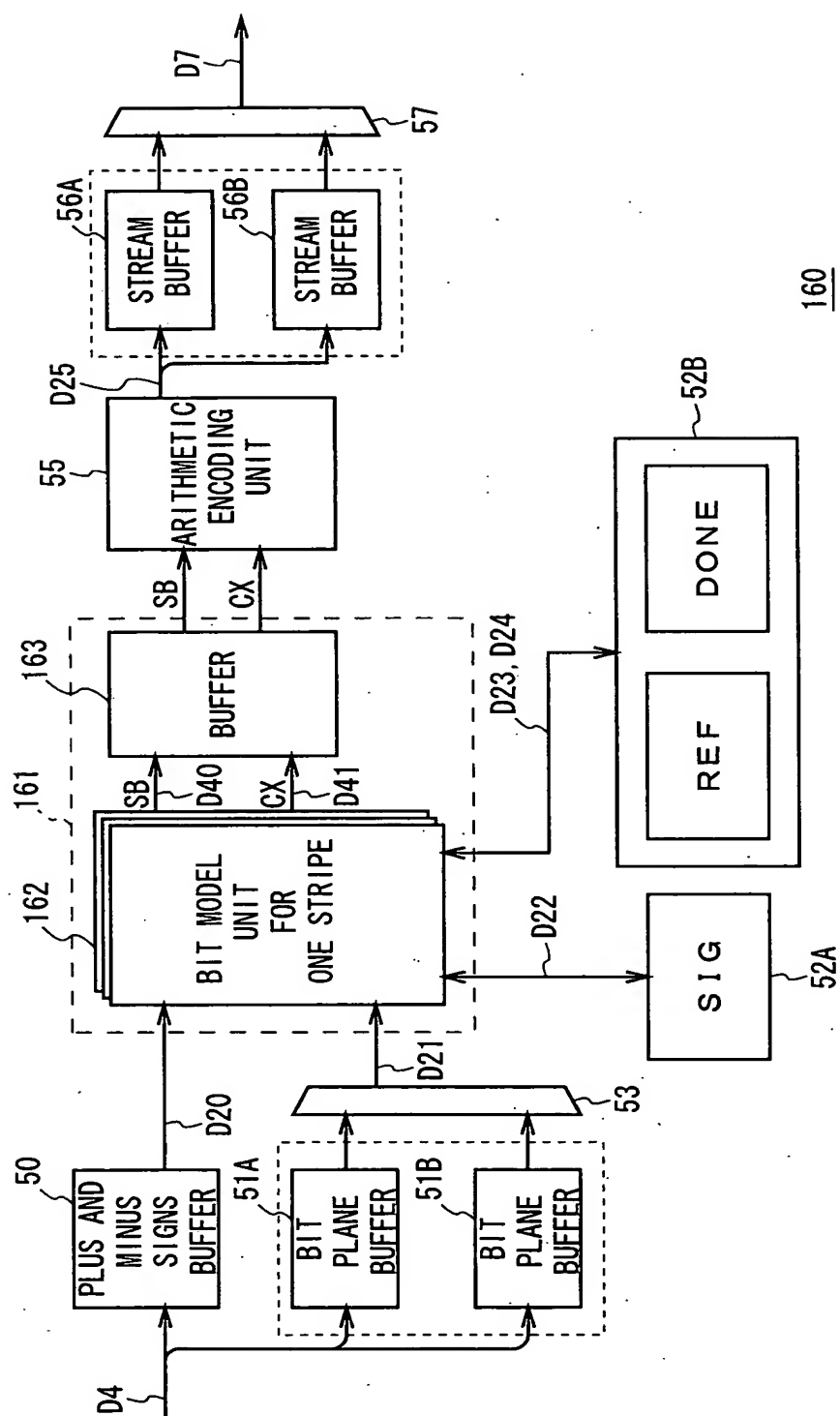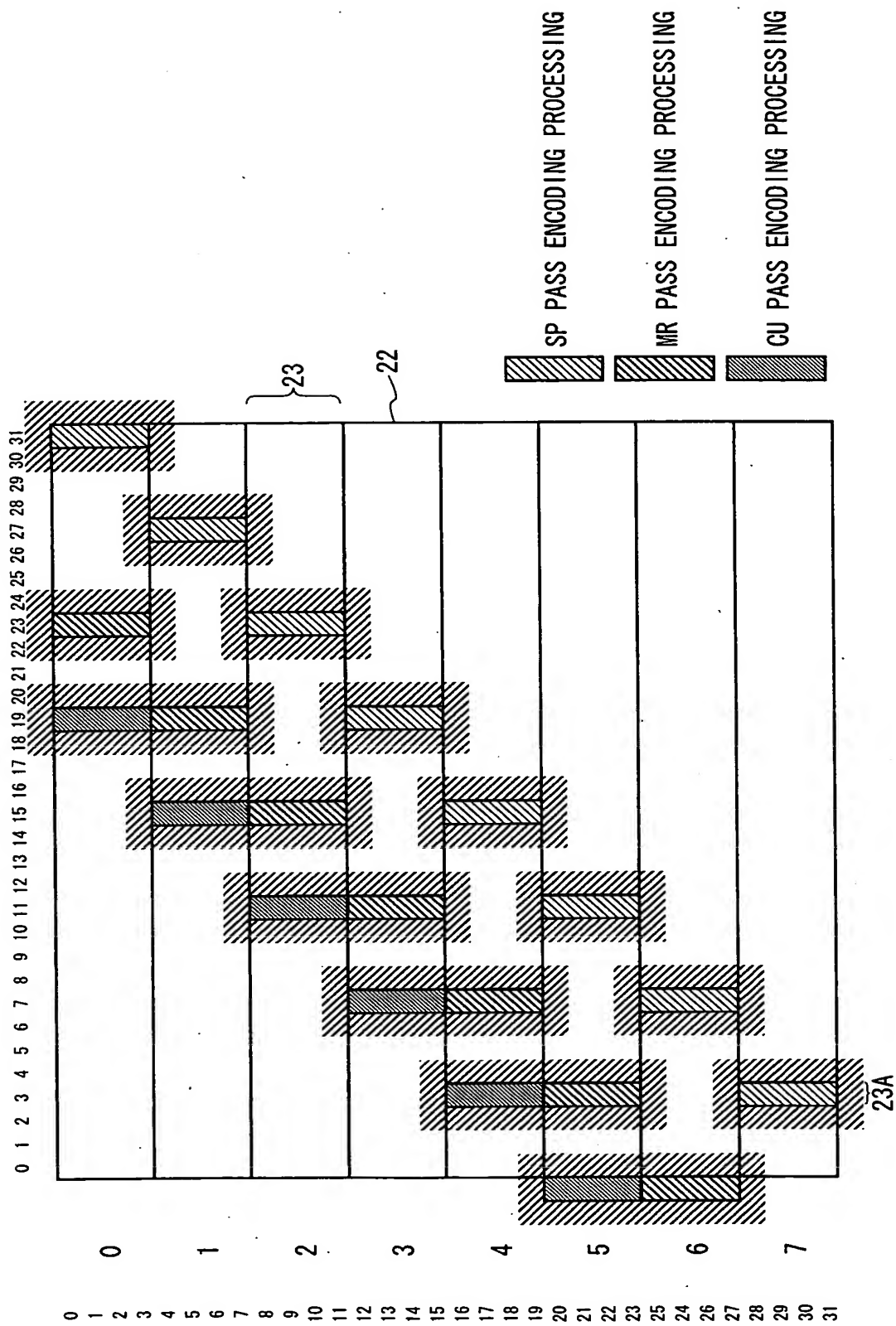FIG. 29

FIG. 30

FIG. 31

FIG. 32

Sequencer/TG 146

D34 122

140A 140
Value D35

145

142A 142
Significance D30

CX out

SEL

143A 143
Refinement D31

144A 144
Done D32

FIG. 33

FIG. 34

D7

57

56A
STREAM
BUFFER
56B
STREAM
BUFFER

160

D25

55
ARITHMETIC
ENCODING
UNIT

52B

163
BUFFER

DONE

SB

CX

161

D23, D24

REF

SB   D40

CX   D41

162

BIT MODEL
UNIT
FOR
ONE STRIPE

D22

SIG

52A

D20

D21

50
PLUS AND
MINUS
SIGNS
BUFFER

53

51A
BIT
PLANE
BUFFER

51B
BIT
PLANE
BUFFER

D4

FIG. 35

FIG. 36

SP PASS ENCODING PROCESSING

MR PASS ENCODING PROCESSING

CU PASS ENCODING PROCESSING

FIG. 37

FIG. 38

23

22

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

23A

23A

23A

23A

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31

SP PASS ENCODING PROCESSING

FIG. 39

FIG. 40